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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/879,831	06/13/2001	Ari Hottinen	P 280346 T298101US/PYK/kp	3478

909 7590 03/28/2005

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EXAMINER	
ZHENG, EVA Y	

ART UNIT	PAPER NUMBER
2634	

DATE MAILED: 03/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/879,831	HOTTINEN ET AL.	
	Examiner	Art Unit	
	Eva Yi Zheng	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 October 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3-32 and 35-101* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *8,13-15,32,40,43-45,78 and 81-83* is/are allowed.

6)☒ Claim(s) *3-7,9-12,16-31,35-39,41-42,46-77,79-80,84-101* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed October 18, 2004 have been fully considered but they are not persuasive. The Examiner has thoroughly reviewed Applicant's arguments but firmly believes that the cited reference reasonably and properly meet the claimed limitation as rejected.

Applicant's argument – "Greenstein do not disclose, teach or suggest formation of a quality value is then used along with the weighting coefficient data signaling received by a transmitter, wherein the quality value is then used along with the weighting coefficient data signaling itself to form weighting coefficients of the weighting coefficient data signaling as recited in independent claims 3 and 35".

Examiner's response – Applicant is reminded that the Examiner is entitled to give the broadest reasonable interpretation to the language of claims. Applicant failed to give a specific and precise definition of the term "quality value". According to the specification of application, block 208 and 216 in Fig. 2A forms the quality value for weighting coefficient data it has received (page 18, [0086]). Block 216 in Fig. 2A receives data from antenna 218 and output to the input of a controller 208, which form a quality value for the weighting coefficient. Greenstein discloses a receiver 220 (Fig. 2A) couples with antenna 17 and outputs to a processor 230, which controls the weighting coefficient, W1 and W2. Processor generates the quality value of the weight coefficient. Moreover, Greenstein has the same configuration as the current application for

generating a quality value. Therefore, Greenstein did not fail to teach or disclose claim limitations in independent claims 3 and 35.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

3. Claims 3-7, 9-12, 16-31, 35-39, 41-42, 46-77, 79-80, and 84-101 are rejected under 35 U.S.C. 102(e) as being anticipated by Greenstin et al. (6,131,016).

a) Regarding claim 3, Greenstin et al. disclose a method of transmitting a digital signal from a transmitter to a receiver in a radio system, the method comprising:

the transmitter (10 in Fig. 1) transmitting at least a part of the signal via at least two different transmit antenna paths (15 and 16 in Fig. 1); and

the receiver receiving the signal (20 in Fig. 1);

wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another in the transmitter (202a and 203a in Fig. 2A) by means of changeable weighting coefficients determined for each transmit antenna path (Col 4, L53- Col 5, L36);

wherein the receiver performs measurements on the received signals that were transmitted via the different transmit antenna paths (as shown in Fig.1);

wherein the receiver signals to the transmitter the weighting coefficient data formed on the basis of the measurements (280 in Fig. 2B);

wherein the transmitter (220 in Fig. 2A) forms weighting coefficients by means of the weighting coefficient data signaling (201 in Fig. 2A; Col 3, L34-37);

wherein the transmitter forms a quality value for the weighting coefficient data signaling it has received (230 in Fig. 2A);

wherein the transmitter forms weighting coefficients by means of the quality value of the weighting coefficient data signaling and the signaling itself (201, 202a and 203a in Fig. 2A).

b) Regarding claim 35, Greenstin et al. disclose a radio system for transmitting a digital signal, comprising:

a transmitter for transmitting a signal (10 in Fig. 1);

at least two transmit antenna paths that can be connected to the transmitter (15 and 16 in Fig. 1);

a receiver for receiving the signal (20 in Fig. 1);

wherein the transmitter comprises

changing means (230 in Fig. 2A) for changing the weighting coefficients determined for each transmit antenna path with respect to one another, and

weighting means (202a and 203a in Fig. 2A) for weighting the transmit power of the signals to be transmitted via different transmit antenna paths (202 and 203 in Fig. 2A) by means of weighting coefficients that can be changed with respect to one another;

wherein the receiver comprises means for performing measurements on the received signals that were transmitted via the different transmit antenna paths, and means for signaling to the transmitter the weighting coefficient data formed on the basis of the measurements (280 in Fig. 2B); and

the transmitter further comprises means for receiving the weighting coefficient data signaling, and wherein the changing means form weighting coefficients using the weighting coefficients data signaling (201 in Fig. 2A; Col 3, L34-37), and

wherein the transmitter comprises means for forming a quality value (230 in Fig. 2A) for the weighting coefficient data signaling it has received, and the changing means form weighting coefficients using the quality value of the weighting coefficient data signaling and the signaling itself (201, 202a and 203a in Fig. 2A).

c) Regarding claims 4, 36, 74 and 97, Greenstin et al. disclose the values of the weighting coefficients are predetermined, and the predetermined values of the weighting coefficients are divided into different groups, each of which has a particular weighting coefficient for each transmit antenna path, the weighting coefficient data

signaling comprising information about which group of weighting coefficients the receiver wants to be used (output signal from 201 in Fig. 2A feed into 202a and 203a inherent as predetermined coefficient).

d) Regarding claims 5, 37, 75 and 98, Greenstin et al. disclose the weighting coefficient data comprises information about the transmit antenna path via which the signal with the best quality value was transmitted (Col 4, L 53- Col 5, L6).

e) Regarding claims 6, 38, 76 and 99, Greenstin et al. disclose the weighting coefficient data comprises differential information indicating how the ratios of the weighting coefficients for the transmit antenna paths are changed differentially (Col 5, L7-24).

f) Regarding claims 7, 39, 77 and 100, Greenstin et al. disclose the weighting coefficient

data comprises at least one channel parameter measured by the receiver (as shown in Fig. 2A).

g) Regarding claim 9, Greenstin et al. disclose the weighting coefficients used in the transmission are signaled to the receiver (as shown in Fig. 1 and 2A).

h) Regarding claim 10, Greenstin et al. disclose the weighting coefficients are signaled to the receiver by means of an identification sequence which is inserted in the transmitted signal and which varies depending on the weighting of the signal (Col 5, L7-24).

i) Regarding claim 11, Greenstin et al. disclose the weighting coefficients are signaled to the receiver using modulation, spreading or coding of the signal specifically for each transmit antenna path (230 in Fig. 2A; Col 4, L53 - Col 5, L36).

j) Regarding claims 12 and 42, Greenstin et al. disclose the identification data for the group of weighting coefficients used in the transmission is signaled to the receiver using identification bits inserted in the transmitted signal (230 in Fig. 2A).

k) Regarding claims 16, 46 and 84, Greenstin et al. disclose signals to be transmitted via two different transmit antenna paths are as mutually orthogonal as possible (Col 1, L48-51).

l) Regarding claim 17, Greenstin et al. disclose the orthogonality is implemented by using a different spreading or channel code for each transmit antenna path (Col 1, L51-62).

m) Regarding claim 18, Greenstin et al. disclose the orthogonality is implemented by using a different transmission frequency for each transmit antenna path (Col 1, L48-51; OFDM by definition is a method of digital modulation in which a signal is split into several channels at different frequencies).

n) Regarding claim 19, Greenstin et al. disclose the orthogonality is implemented by using a different slot for each transmit antenna path (Fig. 1).

o) Regarding claims 20, 47 and 85, Greenstin et al. disclose the signal is coded in order to minimize transmission errors in the transmission channel (Col 1, L48-51; "OFDM").

p) Regarding claims 21, 48 and 21, Greenstin et al. disclose the coding is space time coding (Col 1, L48-51; space time coding employ OFDM).

q) Regarding claims 22, 49 and 87, Greenstin et al. disclose the space-time coding is space-time block coding (Col 1, L48-51;OFDM, a type of transmit diversity inherent to employ space-time block coding).

r) Regarding claims 23, 50 and 88, Greenstin et al. disclose the space-time coding is space-time trellis coding (Col 1, L48-51;OFDM, a type of transmit diversity inherent to employ space-time trellis coding).

s) Regarding claims 24, 51 and 89, Greenstin et al. disclose the transmit antenna paths are connected to one base station of the network part in the radio system (Fig. 1).

t) Regarding claims 25, 52 and 90, Greenstin et al. disclose the transmitter is situated in a radio network subsystem (RNS) of the radio system network part (10 in Fig. 1), and the receiver is situated in a user equipment (UE) of the radio system (20 in Fig. 1).

u) Regarding claims 26, 53 and 91, Greenstin et al. disclose a user equipment (UE) of the radio system determines the weighting coefficients (202a and 203a in Fig. 2A) used by the network part of the radio system in transmitting to the user equipment (UE) in question (as shown in Fig. 2A).

v) Regarding claims 27, 54 and 92, Greenstin et al. disclose the network part of the radio system determines itself the weighting coefficients it uses in transmission (230 in Fig. 2A).

w) Regarding claims 28, 55 and 93, Greenstin et al. disclose the network part of the radio system takes into account the loading of each power amplifier (202e and 203e in Fig. 2A) over the transmit antenna path when it makes the decision.

x) Regarding claim 29, 56 and 94, Greenstin et al. disclose a transmit antenna path is implemented by means of an antenna structure that provides phasing (Col 4, L1-12).

y) Regarding claim 30, Greenstin et al. disclose the phasing is determined by means of channel parameters signalled by the receiver (220 in Fig. 2A).

z) Regarding claim 31, Greenstin et al. disclose wherein the phasing of transmission is determined by means of signals that have arrived at the same antenna elements (230 in Fig. 2A).

A) Regarding claim 41, Greenstin et al. disclose the transmitter comprises means for signaling the weighting coefficients used in the transmission to the receiver using pilot bits inserted in the transmitted signal (Col 4, L8-11).

B) Regarding claim 57, Greenstin et al. disclose a radio system for transmitting a digital signal, the system comprising:

a transmitter (10 in Fig. 1) for transmitting at least a part of the signal via at least two different transmit antenna paths (15 and 16 in Fig. 1); and

a receiver for receiving the signal (20 in Fig. 1);

wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another in the transmitter using changeable weighting coefficients (W1 and W2 in Fig. 2A) determined for each transmit antenna path,

wherein a transmit antenna path is implemented using an antenna structure that provides phasing (230 in Fig. 2A); and

wherein transmissions are sent from at least one antenna element with at least two different phases or antenna beams (Fig. 1).

C) Regarding claim 59 is rejected under similar reasons for rejection of claim 3 and 21.

D) Regarding claim 62, Greenstin et al. disclose wherein the receiver send weighting coefficient data to the transmitter, and the transmitter forms the weighting coefficients (W1 and W2 in Fig. 2A) for the antenna beams using the weighting coefficient data (as shown in Fig. 2A).

E) Regarding claim 64 is rejected under similar reasons for rejection of claim 3 and 4.

F) Regarding claims 61 and 66, Greenstin et al. disclose wherein weighting coefficients for the antenna beams are formed at the transmitter (as shown in Fig.1 2A).

G) Regarding claim 67, Greenstin et al. disclose wherein the receiver signals to the transmitter weighting coefficient data, and the transmitter forms the weighting coefficients for the antenna beams using the signaled weighting coefficient data (230, 202a and 203a in Fig. 2A).

H) Regarding claims 63 and 68, Greenstin et al. disclose wherein the antenna beams are adaptive and controlled with at least one of uplink signaling and measurements (as shown in Fig.1 2A).

I) Regarding claim 69, Greenstin et al. disclose a method of transmitting a digital signal from a transmitter to a receiver in a radio system, the method comprising:

the transmitter (10 in Fig. 1) transmitting at least a part of the signal via at least two different transmit antenna paths (15 and 16 in Fig. 1); and

the receiver receiving the signal (20 in Fig. 1);

wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another in the transmitter (202a and 203a in Fig. 2A) by means of changeable weighting coefficients determined for each transmit antenna path (Col 4, L53- Col 5, L36);

wherein the receiver performs measurements on the received signals that were transmitted via the different transmit antenna paths (as shown in Fig.1);

wherein the receiver signals to the transmitter the weighting coefficient data formed on the basis of the measurements (280 in Fig. 2B);

wherein the transmitter (220 in Fig. 2A) forms weighting coefficients by means of the weighting coefficient data signaling (201 in Fig. 2A; Col 3, L34-37);

wherein the transmitter forms a quality value for the weighting coefficient data signaling (230 in Fig. 2A);

wherein the transmit antenna paths are connected to at least two different transmission sectors of a base station in the radio system (15 and 16 in Fig. 1).

J) Regarding claims 71, 72 and 73 are rejected under similar reasons for rejection of claim 3.

K) Regarding claim 79, Greenstin et al. disclose wherein the transmitter is further configured to signal the weighting coefficients used in the transmission to the received using pilot bits inserted in the transmitted signal (Col 5, L 8-24).

L) Regarding claim 80, Greenstin et al. disclose wherein the transmitter is further configured to signal to the receiver identification data for the group of weighting coefficients used in the transmission using pilot bits inserted in the transmitted signal (Col 5, L 8-24).

M) Regarding claims 95 is rejected under similar reasons for rejection of claim 35.

N) Regarding claims 100 is rejected under similar reasons for rejection of claim 3.

O) Regarding claims 60 and 70, Greenstin et al. disclose wherein different antenna beams have different pilot sequences, and the method further comprises:

estimating antenna beam channel parameter using the pilot sequences (Col 4, L20-52);

combining the antenna beam signals using the pilot sequences (Fig. 2B); and

calculating weighting coefficient data for the antenna beams using the pilot sequences (W1 and W2 in Fig. 2A); and

signaling the calculated weighting coefficient data to the transmitter (as shown in Fig. 2A).

P) Regarding claims 58 and 65 are rejected under similar reasons for rejection of claims 60 and 70.

Allowable Subject Matter

4. Claims 8,13-15,32,40,43-45,78 and 81-83 are allowed.

5. The following is an examiner's statement of reasons for allowance:

None of the prior art teaches or suggests a radio transmission system for a digital signal comprising the transmitter transmitting at least a part of the signal via at least two different transmit antenna paths and the receiver receiving the signal; wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another in the transmitter using changeable weighting coefficients determined for each transmit antenna path; wherein the receiver performs measurements on the received signals that were transmitted via the different transmit antenna paths; wherein the receiver signals to the transmitter the weighting coefficient data formed on the basis of the measurements; wherein the transmitter forms weighting coefficients using the weighting coefficient data signaling; wherein the transmit antenna paths are connected to at least two different base stations of a network part in the radio system; wherein the quality value for signaling falls below a predetermined threshold value, the weighting coefficient are not changed and set the weighting coefficients to an equal value over each transmit antenna path; and wherein the quality value for signaling exceeds below a predetermined threshold value, the weighting coefficient are changed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

6. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eva Yi Zheng whose telephone number is (571) 272-3049. The examiner can normally be reached on 7:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571) 272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-879-9306.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Eva Yi Zheng
Examiner
Art Unit 2634

March 11, 2005

SHUWANG LIU
PRIMARY EXAMINER